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THE WORM BURDEN OF FAT LAMBS AND THE DIAGNOSIS OF GASTRO-INTESTINAL HELMINTHIASIS

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Introduction

It is generally accepted that, because of the absence of definite indicative symptoms, the most reliable method of diagnosing gastro-intestinal helminthiasis in lambs is to carry out an *ante-* or *post-mortem* examination of a selected specimen and estimate the numbers of worms present. Before the information thereby obtained can be of value, it is necessary to know to what extent the sheep involved could be expected to tolerate worm infestation without being regarded as diseased, and as there is great variation in the figures given by different workers, the results of a recent personal investigation may be helpful.

MATERIAL EXAMINED

From June, 1937, to April, 1938, worm counts were made on two fat lambs per month obtained from an arable farm in East Aberdeenshire. The farm carries a flock of 300 Cheviot ewes and 500 half-bred lambs, and the grazing is maintained at a high level by appropriate manurial treatment. The lambs, which were born towards the end of March, were grazed in rotation on five fields consisting of one-, two- and four-year-old pasture, the rate of stocking being approximately four ewes per acre. They were not dosed for worms but were given concentrates from the first week of October, consisting of maize, oats and earthnut cake, at the rate of ½ lb. per head per day. Five of the lambs examined were scouring at the date of slaughter, otherwise the condition of the sheep remained normal and satisfactory.

DEGREE OF INFESTATION

The detailed figures of the worm counts are shown in the accompanying table. The results show that each lamb examined up to the age of nine months carried a moderate worm burden, but after that age a marked decrease in numbers took place.

No. of Lamb.	Month. 1937.	Abomasum.		Small Intestine.						Caecum.	L. Intestine.	Totals.
		Haemonchus contortus.	*Ostertagia* spp.	*Nematodirus* spp.	*Trichostrongylus* spp.	*Cooperia curticei.*	*Bunostomum trigonocephalum.*	*Moniezia expansa.*	*Capillaria longipes.*	*Trichuris ovis.*	*Chabertia ovina.*	
L. 34	June	65	2,550	1,800	1,660	85	—	2	—	—	43	6,205
L. 35		20	1,200	3,400	1,400	—	1	—	—	4	6	6,031
L. 36	July	26	2,200	4,200	125	110	2	—	—	3	26	6,692
L. 37		88	1,380	650	490	280	3	4	—	—	2	2,897
L. 38	Aug.	42	820	1,945	82	60	2	—	—	1	75	3,027
L. 39		15	1,100	175	130	20	3	—	—	—	2	1,445
L. 40	Sept.	—	1,780	650	240	73	15	1	—	—	9	2,768
L. 41		24	490	1,240	190	—	—	—	—	4	24	1,972
L. 42	Oct.	—	150	2,528	180	95	—	2	30	34	192	3,211
L. 43		22	280	1,452	57	80	12	1	—	12	91	2,007
L. 44	Nov.	30	380	3,850	202	98	—	—	—	2	12	4,574
L. 45		40	70	5,680	50	68	4	—	—	4	72	5,988
L. 46	Dec.	75	626	612	545	—	—	—	—	8	42	1,908
L. 47		12	232	136	428	32	7	—	—	6	35	888
L. 48	1938 Jan.	—	45	60	95	15	12	—	10	4	—	241
L. 49		2	70	—	48	42	6	1	—	—	54	223
L. 50	Feb.	—	140	—	102	78	8	1	—	1	1	331
L. 51		18	38	—	80	—	3	—	—	12	14	165
L. 52	Mar.	—	52	7	95	—	12	—	—	—	—	166
L. 53		7	28	—	105	92	17	—	—	3	9	261
L. 54	Apr.	3	43	—	82	31	5	—	—	1	45	210
L. 55		—	36	—	154	95	12	6	—	5	6	314

Ostertagia spp. and *Trichostrongylus* spp. were found in all the lambs examined. The highest count for *Ostertagia* was 2,550 worms from a lamb killed in June.

The figures for *Haemonchus* show that infestation with this worm is almost negligible, the highest figure being 88 individuals in July. These results are strongly in agreement with those obtained from many more fat lambs examined from various farms in the north-east of Scotland and clearly indicate that, compared with *Ostertagia*, *Haemonchus* is of minor economic importance in that area. From their investigations on a Scottish Border farm, where the sheep management was perhaps more favourable to worm development, Morgan and Corner (1939) found two lambs yielding over 500 *Haemonchus*, with an average of 142 worms per lamb, and concluded " that it is common enough to cause serious losses when conditions for its development are favourable." In the writer's opinion, there does not appear to be any justification for this assumption since to his knowledge infestations with *Haemonchus*, sufficiently high to cause helminthiasis and serious loss, have not yet been recorded in Scotland.

With regard to *Nematodirus*, up to 5,680 individuals occurred in one lamb, and a greater number of lambs showed heavy infestations with this than with any other species. Similar results were obtained by Morgan and Corner (1939), although their figures were much higher, varying from 52 to as many as 14,700 individuals in one lamb. Kauzal (1933) records up to 32,000 *Nematodirus* spp. in a fat lamb and concluded, as a result of infection experiments, that this parasite is of low pathogenic importance. The writer does not subscribe to these views since in those lambs examined by him, where the infestation was mainly *Nematodirus*, the condition of the animals was poor and anaemic. This was particularly the case in lambs L.25 and L.28 previously recorded by the writer (1937) where 14,980 and 10,540 *Nematodirus* were obtained respectively out of a total worm burden of 20,817 and 19,287 individuals. Although one cannot say definitely that this infestation with *Nematodirus* was responsible for the animals' unsatisfactory condition, these cases point to the necessity for further work on the pathogenicity of this parasite.

The heaviest infestation with *Chabertia ovina* was 192 worms in October. *Post-mortem* examination revealed that the wall of the large intestine was thickened, the mucosa oedematous, and showing numerous haemorrhages and there was diarrhoea. Similar, but less severe symptoms were obtained in L.38, L.43 and L.45 where 75, 91 and 72 *Chabertia* were found respectively.

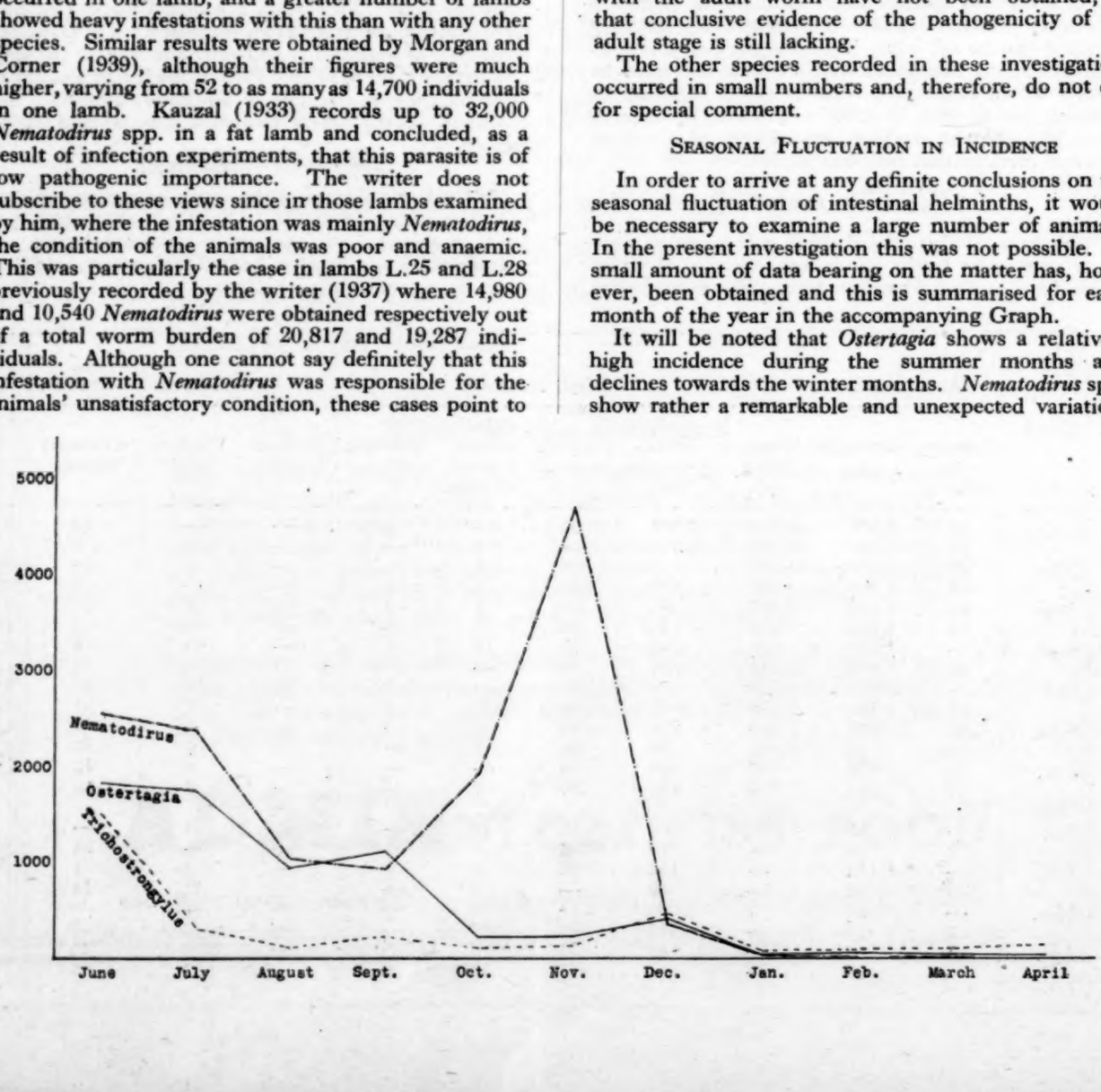
In the past the tendency has been to regard *Chabertia ovina* as of no economic importance but these, and other observations previously recorded by the writer, indicate that it is of common occurrence and is frequently found in sufficient numbers in Scottish sheep to cause a pathological condition of the large intestine. Although there was no noticeable sign of worm infestation *ante-mortem*, it should be noted that they were scouring badly. Whether the scouring was due to the presence of *Chabertia* is not known, but it is interesting to note that Kauzal (1936) in his experimental infections with this parasite found marked evidence of intestinal irritation during its developmental stages. Up to the present, lasting infections with the adult worm have not been obtained, so that conclusive evidence of the pathogenicity of the adult stage is still lacking.

The other species recorded in these investigations occurred in small numbers and, therefore, do not call for special comment.

Seasonal Fluctuation in Incidence

In order to arrive at any definite conclusions on the seasonal fluctuation of intestinal helminths, it would be necessary to examine a large number of animals. In the present investigation this was not possible. A small amount of data bearing on the matter has, however, been obtained and this is summarised for each month of the year in the accompanying Graph.

It will be noted that *Ostertagia* shows a relatively high incidence during the summer months and declines towards the winter months. *Nematodirus* spp. show rather a remarkable and unexpected variation.



Although the numbers are fairly high during the summer months, the graph shows that the peak is reached in November, with a gradual falling off during December and January to a negligible figure in February, March and April.

Kauzal (1933) found in Australian fat lambs that *Nematodirus* remained singularly constant throughout the year. Tetley (1935) in New Zealand found that the incidence of *Nematodirus* spp. varied according to the age of the sheep, and that infection by this parasite was confined almost entirely to lambs less than nine months of age. He concludes that the seasonal period of greatest numbers of *Nematodirus* approximates to the three to seven month stage in the life of the lamb.

The present investigations show that the period during which the greatest numbers of *Nematodirus* occur in lambs is from two to seven months of age, when infection to the number 2,600 to 3,800 worms may be met with.

During the period when infection was normally at its height, marked dissimilarity in the intensity of infections occurred in different lambs, the numbers ranging from 175 to 5,680 individuals. A decline in numbers was found to occur when the lambs were about seven months old and, subsequently, infection had practically disappeared by the time they had reached the age of nine months. These observations are in agreement with those obtained by Tetley who attributes the loss in number to an acquired immunity and not to the development of an age resistance.

Trichostrongylus shows that the greatest numbers are to be found during the early part of summer, but the numbers remained remarkably constant throughout the year. There is no evidence of an acquired immunity taking place, similar to that recorded for *Nematodirus*.

With the exception of October, *Chabertia* shows little variation in frequency throughout the year. The greatest numbers were obtained in October when a total of 192 individuals was found in one lamb. The variation in intensity of infection is very marked, however, as observed in the case of the two lambs examined in August when totals of 75 and two *Chabertia* were obtained.

The persistence of *Chabertia* throughout the year is in keeping with more recent investigations in that heavy infestations may be encountered during the winter months. Twelve lambs examined from an Aberdeen abattoir during January and February, 1938, yielded the following *Chabertia :*

January : 123 : 27 : 63 : 6 : 82 : 45.

February : 205 : 19 : 35 : 79 : 14 : 1.

It may be pointed out that the infective larvae of this parasite have a marked resistence to low temperatures and this fact probably has some influence on the ability of the parasite to survive and infect sheep during the winter months.

Discussion

From the data that has been accumulated, it is evident that fat and presumably healthy lambs may harbour a surprisingly large number of parasitic worms without showing visible signs of worm infestation. Statements such as that made by Daubney (1928), *viz.*, that " about two hundred *Haemonchus* may give rise to fairly well-marked symptoms " are clearly misleading as it has been shown by Fraser and Robertson (1937) that a fat lamb may harbour up to 2,100 *Haemonchus* without showing signs of ill health. Perhaps the most remarkable infestation recorded for a healthy lamb in this country is that observed by Morgan and Corner (1939) where a total of 30,477 worms was obtained from one lamb, including 640 *Haemonchus* and 13,540 *Ostertagia* spp. from the fourth stomach and 14,700 *Nematodirus* from the small intestine. Worm burdens of this nature have been known to give rise to symptoms of helminthiasis and even death. It would have been interesting if a record of the state of the mucosa of the fourth stomach and small intestine of this lamb had been made, as it is difficult to imagine that it was normal with this heavy infestation. However, the fact remains that the animal was in " moderate store condition " and it can, therefore, be stated quite definitely that a lamb can bear an infestation of over 30,000 worms without investigators reporting signs of worm infestation.

These observations tend to make the task of the diagnostician extremely difficult. In spite of all the work that has been done on the internal parasites of sheep, the answer to the apparently simple question of how many worms it takes to kill a sheep still remains unsolved. In all probability, it never will be solved because of the great variation in the sheep's natural resistance to parasitic worms. In other words, while a worm burden of 30,000 may prove fatal to one lamb the same degree of infestation may produce no symptoms of helminthiasis in another of the same flock.

Despite its shortcomings, however, the *ante-* or *post-mortem* examination of selected specimens from a flock yields information of much greater value than that obtained by any other method. If the average worm count is well beyond that commonly met with in healthy sheep of the same age, and the grazing history and management of the sheep are such as to produce conditions favourable to the development of the worms, then the probability of gastro-intestinal helminthiasis being present must be accepted.

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Four types of hounds for fox hunting have been imported into this country (U.S.A.) since the beginning of the present century: (1) English foxhound, (2) Welsh foxhound, (3) fell hound and (4) Kerry beagle. Earlier importations have merged into the American foxhound.—*Vet. Med.*

Salmonella Infections

Royal Society of Medicine Discussion*

Sir William Savage: There are four main features in the Salmonella group:—

1. Salmonellas are true parasites and are not present as saprophytes outside the animal body. They are not natural inhabitants of animal intestines, and when found in animals they represent old infections and are examples of the carrier state. This is of great practical importance for if Salmonellas are true parasites without saprophytic origin then the prevention of their distribution is simplified.

2. The very large number of Salmonella types are all definite entities, and there is no evidence that any type can be converted into another.

3. The pathological manifestations of the group can be divided into three main types, attacks of continued fever, acute gastro-intestinal irritation, and septicaemic infection.

4. They are widespread as cause of disease in man, animals and birds.

The practical prevention of Salmonella outbreaks depends largely on an accurate knowledge of the distribution in nature, and although knowledge is not yet complete there is evidence which suggests that individual types have their selected hosts, and specific pathological manifestation. Examples of some of the better known types are given. In this respect the group can be subdivided roughly into three—an unspecialised type (unrestricted both in host and action), a specialised type with restricted host and definite pathological action, and types on their way to specialisation. The possible lines along which the various types may have evolved towards differentiation are discussed. As an illustration of the practical value of differentiation of type, outbreaks due to *B. enteritidis* var. *dublin*, which it is suggested has a specialised host, but not yet with specialised action, are described.

Dr. R. Lovell: Members of the Salmonella group are common causes of disease in domesticated animals and although many cases are sporadic there are several well-defined diseases in which one particular species of animal may be commonly affected with one special type of Salmonella and act as its host reservoir. Examples are: bacillary white diarrhoea and fowl typhoid, abortion of ewes and mares, and infection of bovines with *S. enteritidis* var. *dublin*. Salmonella infections of animals are of importance both economically and from the public health point of view.

The importance of an accurate knowledge of the host reservoir in the control of Salmonella infections is again stressed. Some of the less common varieties formerly found solely in man but which have now appeared as animal pathogens are discussed. Recently dogs and cats have also been incriminated in the spread of Salmonella infection to human beings. The occurrence of members of the Salmonella group in association with virus diseases, such as swine fever and distemper, is described.

The control of salmonella infections in domesticated animals is mainly by the serological detection of those latently affected; but there are two main difficulties in the interpretation of the test:—

1. The complicated antigenic structure of the Salmonella group.

2. The presence of normal or natural agglutinins against both "H" and "O" antigens in the blood of healthy animals.

It is essential to establish the normal level of agglutinins in the species of animal concerned when carrying out routine serological tests, and attention should be given to age and sex. Two tables are given illustrating the difficulties inherent in the test.

Dr. W. M. Scott: Experiments were carried out to determine whether English pigs slaughtered in apparently normal health were so free from Salmonella infection as previous investigations had suggested. In the first experiment the mesenteric glands and spleens of 500 pigs from a bacon factory in the West of England were examined bacteriologically and of these 23, or 4·6 per cent., yielded Salmonellas. From a further 500 pigs from a factory in East Anglia at least 18 pigs, or 3·6 per cent., were Salmonella infected. The technique used is described, and it is of interest to note that although in all cases three different cultural methods were used, only in one instance did all three methods give positive results, so that there is evident advantage in applying more than one method and preferably several. All these pigs were passed as fit for human food and were used without, so far as is known, producing food poisoning. Infection of the spleen was rare, suggesting that infection of the flesh is also rare, and that only preparations made from offal seem likely to be commonly infected. It is suggested that the infection was of recent alimentary origin and may occur during the fasting period in lairs before slaughter; but further investigation as to the source of the infection is necessary.

R. F. Gordon: Even excluding pullorum disease and fowl typhoid, Salmonella infections in birds are not rare, and frequent references have been made to outbreaks of disease caused by *S. typhi-murium, S. enteritidis gaertner* and *S. anatum*. The isolation from birds of *S. paratyphosus B, S. abortus equi, S. newport* and *S. senftenberg* has also been recorded. The importance of Salmonella infections in birds is increased by the possibility of food poisoning in man from the ingestion of infected duck eggs.

An extensive outbreak of disease in ducklings due to *S. typhi-murium* is described. There were 57,000 ducklings involved and losses totalled 30 per cent. with a daily mortality of 1,000. The most effective method of reducing the gross mortality was the improvement of hygiene on the rearing farm. A routine blood test of the entire breeding stock was carried out, but was not successful in reducing the number of carrier birds, and the mortality was not appreciably influenced by the persistence of carriers in the breeding flock. Breeding experiments and the cultural examination of eggs laid by reactor birds gave negative results. This, together with field observations, tends to indicate that egg transmission was not the most important factor in the dissemination of infection, in spite of the fact that the organisms under study have been recovered from the ovary of 50 per cent. of the reactor ducks examined bacteriologically.

*Abstracted from the *Proceedings of the Royal Society of Medicine*. Vol. xxxiii, No. 6, April, 1940. Pages 357-370.

As a result of the discovery of Irish cattle badly affected by warble fly, steps are being taken by Farmers' Union Headquarters and by the Diseases of Animals Committee of the Gloucestershire Agricultural Committee to press the Minister of Agriculture to order the inspection of Irish cattle at all ports of arrival.

THE VETERINARY RECORD
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SALMONELLA INFECTIONS

IN February a discussion on Salmonella Infections took place at the Royal Society of Medicine and was the occasion for a united meeting attended by epidemiologists and medical and veterinary pathologists. It is interesting to review the history of the Salmonella group of bacteria, for the study of this genus has helped forward materially our general concepts of the nature and mode of action of many bacterial species. It is little realised that it was 37 years ago that Theobald Smith and his colleague Reagh pointed out that the agglutinins induced by the action of the body of the hog cholera bacillus were different from those induced by the flagella. We are wont to forget this important observation, for a lapse of about 17 years occurred before its importance was appreciated and the double antigenic structure of members of this group was recorded by Weil and Felix. Two years later Andrewes observed the phase variation often associated with his name. These studies laid the foundation for the present method of classification which has been so ably worked out by pioneers such as Bruce White and Kauffmann. Considerable progress has been made and there are now over 80 types of this group listed and at the outbreak of war the International Salmonella Centre in Copenhagen was working in close co-operation with 37 Salmonella centres which had been created in various countries and it was thereby hoped that a world-wide intensive but co-ordinated study of Salmonella problems would be made.

This genus has provided material for other original work in experimental epidemiology and bacteriological chemistry. Raistrick, Topley and their colleagues and Boivin and his co-workers have made use of Salmonella for elucidating the nature and functions of chemical fractions of bacteria. The bacteriologist and now the chemist owe a debt to the Salmonella group.

The epidemiologist has also found here a useful and fruitful field and the abstract of the discussion printed in this issue records the emphasis which Sir William Savage laid on the true parasitic nature of these organisms, their varying pathological manifestations and their extensive activity as a cause of disease in man, other mammals and birds. Over a long period of years he has interested himself in Salmonella problems, especially those arising from the types which are pathogenic for man and animals. The essence of the discussion which he opened was that the sources of infection in Salmonella food poisoning must be looked for in Salmonella animal diseases and that the effective control of human infections is largely dependent on our knowledge of the distribution of the different types. This theme was continued by Lovell, who pointed out that although some of the animal diseases were of economic interest, others were of considerable importance to the public health. He quoted abstracts from the literature showing the lack of evidence of the source of many outbreaks of human infections. We are indebted to Scott for a further contribution to our knowledge in this field by his description of the presence of Salmonella in healthy pigs at slaughter. Special interest attaches to Gordon's review upon the importance of Salmonella infections in birds.

Epidemiology, human pathology, animal pathology and comparative medicine have all benefited from the study of this group, but in spite of the work already done and the mass of literature which has resulted we have still a long way to go before we can effectively control the pathological manifestations of these bacteria. Further study and observation along certain well-informed lines are necessary. One general aspect on which we appear to be ignorant concerns the reservoirs of infection and this is largely a problem for workers in the veterinary field. Let us look forward to the time when our share in the solution of these puzzles shall be of material benefit to the public health as well as to the animal population.

LONDON COLLEGE TENNIS FOR THE V.V.B.F.

The finals of the Royal Veterinary College Doubles Tennis Tournament in aid of the Victoria Veterinary Benevolent Fund were played off at Streatley House, Streatley, on Saturday, June 15th. The finalists were Wooldridge and Weatherhead of Streatley and Nye and Thompson of Sonning, the first pair winning. Reading was represented in the semi-finals by Threlkeld, Junr., and Underwood.

The entrance fee to the event was 1s. and by this means, coupled with a considerable amount of support by way of voluntary donations, £2 10s. 0d. was subscribed by Streatley (4th and 5th years) and £5 by Reading and Sonning (1st, 2nd and 3rd years).

The Immediate Past President and the President of the Ladies' Guild, Mrs. Wooldridge and Mrs. Male, attended and presented prizes to the winners and runners up. Many members of the staff with their wives attended, including Professor Buxton, Professor Wooldridge (President of the Royal Veterinary College Tennis Club), Professor and Mrs. Bosworth, Professor and Mrs. Wright, Mr. and Mrs. Ottaway and Mr. and Mrs. Scorgie.

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CHANNEL ISLANDS CATTLE

" Plans for assisting Channel Island farmers to re-stock their farms with pedigree cattle after the war are being prepared by the English Jersey and Guernsey Cattle Societies," states the *Farmers' Weekly*. " Breeders of both breeds, fearing that the Nazis will either disperse or destroy the famous herds now under their control, have already put forward a number of suggestions for helping the Channel Island farmer to start again. Both Societies have agreed to discuss, at their next Council meetings, the problems of providing the foundation stock necessary to rebuild the herds. Members will then be invited, it is understood, to put forward opinions on the best method of providing stock and of arranging the necessary financial assistance."

CLINICAL COMMUNICATION

The Sulphonamide Compounds, and some Reflections on Veterinary Medicines in General Practice

W. M. SCOTT, F.R.C.V.S., D.M.V. (ZUR.)
BRIDGWATER

The interesting papers by Mr. W. S. King and Mr. S. L. Hignett read before the Central Veterinary Society and the subsequent discussion as published in the *Veterinary Record* of June 22nd give food for much thought and speculative reflection. If a chemical compound could be found capable of destroying—*in vivo*—the almost ubiquitous streptococcus especially of the virulent haemolytic type, then indeed chemical therapeusis will have supplied a much-felt want. Like that of many another new discovery, its advent was ushered in with a great flourish of trumpets. I trust it will stand the test of time. It appears, however, that much has to be unravelled before the action and uses of this drug are placed upon a sound scientific basis. In the meantime the clinician must walk carefully while the researcher goes on with his researches.

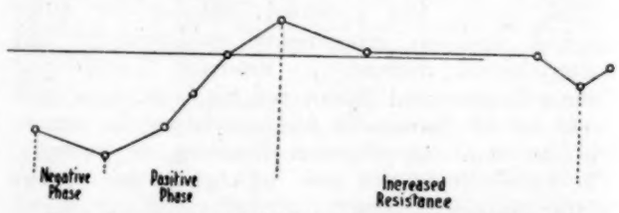
My own experience of the sulphonamides " in the field " has not, so far, been extensive ; therefore I do not pretend to speak with any authority, but I am reminded of a recent case where benefit appeared to follow its administration.

The subject was an aged mare, well known at " point-to-points," suffering from one of the most acute forms of parturient laminitis I have ever seen. During the initial stage the usual orthodox treatment was carried out while the patient steadily grew worse. I then took a uterine swab which, when examined microscopically, revealed streptococci and staphylococci, the ratio being about 4 to 1. An anti-streptococcal polyvalent serum was injected and the patient placed upon a course of M & B 693, soon to be followed by an autogenous vaccine. Within a week the results were, to say the least, spectacular ; the animal was able to walk about freely and without perspiration although the weather was extremely hot. Prior to this phase the patient stubbornly refused to move and was recumbent most of the time. The system must have been fully charged with toxic and bacterial protein elements and probably, too, histamine absorption from the bowels.

Of course it is impossible here to know to which agent the credit of the recovery is due ; probably each played a major part in the curative rôle. But of this much I am certain—the animal would either have died under orthodox treatment or gross lesions would have taken place within the hooves, whereas, on the contrary, the disease was cut short and there were no untoward sequelae.

In the discussion following the paper I noticed many interesting points were raised. Dr. Hare's description of the action and reaction of the streptococcus upon the various tissues of the body complex is timely, for many practitioners still cling to the old water-tight compartment fetish in these specific infections. It must also be borne in mind when one assesses the antibacterial virtues of any drug that the animal body possesses all the attributes to resist and often ultimately thwart bacterial aggression through its own immunising mechanism and it is only when that mechanism gets out of gear and breaks down that the invader gains a footing (negative chemotaxis). The main line of defence—the phagocytes—are then routed, for phagocytosis will not occur where negative chemotactic influences obtain, the sequel being a septicaemia.

The phagocyte in the eyes of the immunologist is a very vital entity which nothing known to science can supplant. It is imperative therefore that these cells should ever be at the high-water mark of defensive activity and, if not, placed there. Dr. Hare was no doubt bearing this activation in mind when he said "our procedure in febrile cases of *Beta haemolytic streptococcus* infection should consist of the combination of vaccine and sulphonamide in order to obtain synergic action." I would not, however, advocate the use of an autogenous or stock vaccine in the *acute* stage of any specific fever unless it was " buffered " beforehand by an appropriate antiserum, should there be one ; and I am not sufficiently *au fait* with the action of sulphonamide to presume it would take the place of a serum or act as a " buffer." The reason is simple and obvious. The series of phenomena following active immunisation by vaccines is naturally a very complex and involved one. Briefly, one is a fall in the amount of opsonin present in the serum. This fall in the immunising index is called the " negative phase " and occupies a period of 12 to 36 hours. The larger the dose of antigen the greater the fall and *per contra* a minimum dose may eliminate this fall altogether ; with this fall of the index there is usually a rise in temperature, an increase of pulse beat and a slight constitutional disturbance, and where one is dealing with a local infection—for example in a suppurating wound—there is an increase of the inflammatory phenomena, *i.e.* an increase of pus, pain and swelling. Gradually these and the constitutional disturbances—if any—become reduced. We have now entered into the second or " positive phase." The opsonic index rises and the third phase, " the phase of increased resistance" is reached. The chart gives an idea of how the body forces react to an antigen.



(From the author's work " Clinical Bacteriology and Therapy.")

It will be gathered from the foregoing that to administer an active antigen in an acute febrile condition is, by reason of the fact that it causes depletion of the immunising index, contra-indicated and is mal-practice—unless, as pointed out, the dose is minimal, and I often query if a minimal dose possesses much activating power, if any. It may be urged, however, that such a dose can act as a forerunner to larger doses to follow. Of course the ideal here would be to control inoculation by blood tests, but this in general veterinary practice is too elaborate and expensive to be practical.

In discussing phagocytosis another speaker made the following observation : " Instancing cases of human lobar pneumonia with a leucocytosis of, say, 20,000 to 40,000 and a high proportion of neutrophil polymorphs, it is difficult to see that such a leucocytosis was not

adequate or how a concurrent administration of a vaccine was needed if the action of a vaccine was to stimulate the leucopoietic function." May I here suggest it is not so much the number but the fighting capacity—immunising qualities—of the leucocytes which count, in the ultimate. Every time a leucocyte devours an aggressor and survives, its aggressive and immunising index is on the ascendant, for in " a battle shock " cell its armour becomes more resistant to bacterial attack and herein lies the key to active immunisation and ultimate recovery.

This brings me to my concluding remarks now intended specially for the younger members of our calling. I might call them " Drug therapy *versus* Vis Medicatrix Naturae."

In my student days I was brought up on Findlay Dunn's "Actions and Uses of Veterinary Medicines," which I then looked upon as my bible, and the descriptions were so cunningly and conveniently arranged and so beautifully conceived, that one felt one had only carefully to combine a set of drugs and good results were bound to follow. After a few years in practice, I found, however, I had been " looking thro' a glass darkly "—the scales were beginning to fall from my eyes. Nature in many instances, I felt, was doing the work and man in his arrogance, with his medicines, was taking the credit. Our recoveries in truth were in many cases not due to our remedies at all, but in spite of them. My first Principal was an active apostle of drug therapy and I was, I confess, his willing disciple. In particular, well do I remember his methods of treating pulmonary affections in bovines by continued drenching—with the bottle or horn—with his favourite drugs and " to keep the patient's strength up," nutrient gruels, etc., were poured into their stomachs religiously. The net results were no credit to our methods.

And then the dawn came—I went to the other extreme of almost " masterly inactivity " in those cases. Drenching in any shape or form was taboo. In its place an electuary or powder was placed on the tongue, the sheet anchor of this being sodium citrate.* This, by the way, is a valuable decalcifying agent, the object being to reduce fibrin formation in the lung parenchyma and so allow the bacteriotrophic serum and the phagocytes to reach the " housed " bacterial foci. Sodium chloride was also freely given to create thirst so that the eliminative organs should be well flushed, for obvious reasons.

The next step was a starvation diet during the acute stage, plenty of fresh water (coupled with fresh air) and sloppy bran, the object being to diminish the capacity of the digestive system to allow an easier thoracic movement and also prevent " clogging " of the liver and stimulation of the eliminative organs. Under this regime I very rarely lose a case of pulmonary disease provided (1) the owner has not forestalled my visit by a course of home-doctoring; (2) there is no tuberculosis in the background and (3) the animal is constitutionally sound.

Conclusions

Nature is a wonderful physician, ever working out her own salvation. Ever to emulate her methods therefore must be the *prima facie* object of the physician and she will not let him down if he follows in her lines, generally speaking. On the contrary, go against her and she will claim her revenge. Of course the practitioner can and does assist nature in many ways—everyone recognises this. Moreover, where she is badly " mauled " she may fail. In such cases when nature does fail, art can step in and assist in bringing about resolution—sometimes.

*It is obvious of course where irregularities arise and complications supervene, adjuvantal treatment, to cope with these, is indicated.

ANNOTATION

The Bacteriology of Infected Wounds

In a series of articles contributed recently to *The Lancet** on the Prevention and Treatment of Wound Infection Dr. Robert Cruickshank discusses the Bacteriology of Infected Wounds by a review of the bacteriological causes of wound infection, their possible sources, and the methods of specific prophylaxis and treatment. Although this paper deals with the human subject much of it can be applied to the domestic animal and the most important points are noted below.

Dr. Cruickshank states that the principal bacterial infections which attack wounds are pyogenic infection, gas gangrene and tetanus; thus the bacteriologist has to look for the pyogenic aerobes and the sporing anaerobes.

Pyogenic Infection.—The most important invader in pyogenic infections is *Streptococcus pyogenes*, with *Staphylococcus aureus* second; next come the coliform group together with *Bacillus proteus* and *B. pyocyaneus*. This latter group of bacilli are more often prominent in the later stages of wound infection and although they may contribute to the delayed healing of the wound they are to be regarded more as contaminants than as pathogens. Saprophytic organisms include the enterococcus, white staphylococci, diphtheroids, sporing aerobes of the subtilis group and indeterminate Gram-negative cocci, all of which may be found at any stage of the infected wound.

Strep. pyogenes, as well as occurring as the primary infection of a wound, may gain access after granulation has begun and possibly escape clinical observation. Such secondary infection delays healing, produces a degree of toxaemia, and may at any time extend to tissues beyond the wound, especially if and when surgical interference is required. *B. proteus* or *B. pyocyaneus* are unlikely to produce a generalised infection but they may be important in the initiation of anaerobic infections as well as masking the presence of more pathogenic bacteria.

Gas Gangrene.—In man this condition may be caused by one or a combination of sporing anaerobes of which the most important are *Clostridium welchii* Type A, *Cl. septique*, *Cl. oedematiens* and possibly *Cl. histolyticum*. The bacteria causing the initial infection are poorly proteolytic and much of the tissue destruction and oedema following the gaseous infiltration are caused by proteolytic commensals such as *Cl. sporogenes*. With the exception of *Cl. histolyticum* and the addition of *Cl. chauvoei* the same organisms may be encountered in the domestic animals.

Tetanus.—It is mentioned by Dr. Cruickshank that now that the human population at risk may be actively

*The Lancet. (1940.) **238**. 704-6 & 750-2.

(*Continued overleaf.*)

or passively immunised against it, tetanus is much the least serious of the clostridial infections. Under this heading there is nothing of veterinary importance.

Other Infections.—The bacterial flora of wounds treated by the methods of Winnett Orr and the Spanish surgeons is discussed. According to Trueta (*J. Proc. R. Soc. Med.* 1939. **33.** 65) there is a great diversity of bacteria but principally staphylococci, streptococci and *B. pyocyaneus*. He thinks the last-mentioned organism may be antagonistic to the pyogenic cocci ; as healing progresses it becomes more prominent and other organisms tend to disappear.

Specific Prophylaxis and Treatment

The place of specific antibody in the prophylaxis and treatment of bacterial infections must not be overlooked in preference to chemotherapy, especially where the bacteria concerned are actively toxigenic, for the sulphonamides have probably little direct neutralising effect on toxin.

Pyogenic Infection.—Prophylaxis by specific vaccines is not at present a practical procedure. For chronic infections such as the discharging sinus, the infected joint or the non-healing wound, autogenous vaccines may be used.

Gas Gangrene.—There is still dispute as to the effectiveness of antitoxins for prophylaxis and treatment. In Spain, Trueta (*J. Proc. R. Soc. Med.* 1939. **33.** 65) dispensed with its use when dealing with air-raid casualties and other war wounds, and had only one case of gas gangrene among over 1,000 cases. There are, however, cases where the use of specific antitoxin is indicated, particularly where there is likely to be any delay in débridement. The prophylactic antiserum should contain a mixture of the three common infecting types, *i.e. Cl. welchii, Cl. septique* and *Cl. oedematiens*.

Tetanus.—Prevention is better than treatment and the best means of prevention is specific prophylaxis along with early excision of the wound.

Dr. Cruickshank finishes by saying that, with regard to the present vogue of treating bacterial infections with the sulphonamides alone, there is much experimental evidence in support of the view that a combination of this chemotherapy with the use of specific antisera, vaccines or toxoids is the most effective method of holding the invader in check and so allowing the natural defences of the body to complete its destruction.

At the same time as these articles appeared in *The Lancet* the discussion at a meeting of the Section of Pathology of the Royal Society of Medicine was reported in the *British Medical Journal*†. This discussion was on the effect of antiseptics in wounds and it would not be inappropriate to consider it along with the bacteriology of infected wounds.

Professor Alexander Fleming pointed out that it was necessary to study the effect of antiseptics on leucocytes as almost all the common antiseptics had a greater destructive effect on leucocytes than they had on bacteria, so that certain concentrations rendered blood a first-class culture medium.

Mr. Murray Falconer described some experiments carried out by Dr. Dorothy Russell and himself in an effort to determine which of the antiseptics of acknowledged germicidal potency was least damaging to the cerebral tissues. With a few important exceptions all antiseptics inflicted haemorrhage and necrosis on the brain. The two principal exceptions were proflavine sulphate and 2 : 7-diaminoacridine hydrochloride, which when applied in a concentration of 0·1 per cent. in isotonic saline buffered to *p*H 6·2 proved little more nocuous than neutral isotonic saline. On the other hand, two closely related compounds—acriflavine and euflavine—caused intense necrosis and haemorrhage. Proflavine sulphate had been proved to retain its efficiency when applied to wounds.

Mr. M. C. Manifold stated that a series of experiments had been carried out to study the effect of various antiseptics on the ability of brain tissue to respire in air or oxygen. The results of these experiments showed that proflavine sulphate and 2 : 7-diaminoacridine hydrochloride caused much less inhibition of the normal respiration of the tissue than acriflavine, euflavine, merthiolate, metaphen and azochloramine.

W. M. H.

†*Brit. med. J.* (1940.) 631-632.

ABSTRACTS

[PHYSIOLOGICAL STUDIES OF INDUCED AND NATURAL BLOAT IN DAIRY CATTLE. Doughty, R. W. (1940.) *J. Amer. vet. med. Ass.* **96.** 43-48. (6 refs. 2 tables.).]

The author considers the relative importance of factors involved in their condition, namely, the character of the gases present in the rumen, and the mechanical reaction following increased intrarumenal pressure. Though it appears unlikely that the latter is responsible for any deaths, it is significant that the rate of gas absorption is increased, so that increased intrarumenal pressure by the formation of an innocuous gas will increase the toxicity of small amounts of a harmful one.

Regarding their character, tests were carried out with various gases and mixtures of gases. Carbon monoxide insufflation, supplemented with a rise in intrarumenal pressure produced by means of other gases, provoked similar symptoms to those in natural cases and belching was inhibited. Apparently carbon monoxide is produced in large amounts following the feeding of freshly-cut clover.

Carbon dioxide, similarly absorbed from the rumen, causes more marked dyspnoea, particularly under higher pressures.

Under natural conditions, carbon monoxide present in very low concentrations will produce marked symptoms when there is only a moderate degree of intrarumenal pressure produced by other gases.

A. E. K.

* * * * *

[THE ASSIMILATION OF CALCIUM AND PHOSPHORUS BY THE GROWING BOVINE. Otto, J. S. (1938.) *Onderstepoort, J.* **10.** 2. 281.]

Balance studies on cattle were carried out to test the availability of the P (phosphorus) in various commercial phosphates. At a P level well below the actual requirement of the animal employed, with the Ca : P ratio maintained at 2 : 1 throughout, the added P of disodium hydrogen phosphate was retained at 100 per cent. and that of dicalcium hydrogen phosphate and bone meal very slightly lower than this figure. At an optimum level of P in the basal ration, the retention of the P of these supplements was reduced by about 10 per cent. Retention of Ca, supplied as the carbonate, when insufficient was present in the basal

ration and the phosphate supplement, varied from 65 to 100 per cent., irrespective of the supplement fed. Long term metabolism experiments were conducted with growing cattle at different levels of mineral intake though with the constant optimum, Ca : P ratio. The level of blood inorganic P, mineral balances and bone analyses were taken as criteria of P sufficiency. 5·8 g. P and 12 g. Ca, or less were insufficient, but 8·5 g. P and 16·4 g. Ca were adequate for growing steers. The percentage ash in the green bones proved to be a reliable index of the degree of calcification and a close correlation was found to exist between this index and the breaking strength of the metacarpus for animals of the same age. For growing heifers a daily ration of 23 g. Ca and 10·5 g. P was found to be adequate on the evidence of mineral balances, blood inorganic P determinations and bone analyses. By varying the intakes of the Ca and P, with consequent departure from the optimum ratio, there was less efficient retention of both elements. The quantities of Ca and P present in the ration apparently determined, more than any other definable factor, the actual quantities of these elements retained in the body. High retention of Ca or P, or both, follows upon high intake of the element concerned. A. E.

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[A NEW DISEASE OF PIGS. (Trans. title.) Donatien, A., and Lestoquard, F. (1939.) *Bull. Acad. vét. Fr.* **12**. 298.]

During the preparation of swine-fever antiserum, an acute or hyperacute infectious disease with very high death rate was seen. Swine fever can be eliminated because the disease occurred in immunised animals and influenza because it was easily transmissible by inoculation of small quantities of blood.

Signs and Symptoms.—The onset is rapid, the temperature is 104° F. to 105° F., and drops only just before death. The animal lies on its side neither eating nor drinking. On the inside of the limbs are dark lenticular spots—always few in number. Respiratory movement may be duplicated. There is sometimes a frothy exudate from the nostrils. Death follows in about three days.

Post-mortem Examination.—The most striking feature is splenic enlargement—up to twice the normal; the capsule strips easily and the pulp is black.

The liver is generally congested, sometimes with haemorrhages. Scattered haemorrhages are seen on the surface and in the substance of the kidney. The bone marrow is pink. The gastric mucosa is reddish purple or dark red. There is enteritis of the small intestine and acute colitis. The lung is normal or oedematous.

Histologically the central nervous system is normal. The suprarenal gland is normal, but the splenic structure is obscured by haemorrhage. The bone marrow shows a definite cellular reaction. In the liver there is haemorrhage in the region of the central vein of the lobule causing atrophy and degeneration of the liver cells. In the kidney the cells in the convoluted tubules are degenerate and there is glomerular haemorrhage. The myocardium shows scattered haemorrhages.

The lesions of the spleen, stomach and lungs serve to differentiate this condition from the other diseases liable to be confused with it.

No known bacterium could be demonstrated by microscopical examination. Cultures remained sterile for the most part. None of the usual experimental animals other than the pig is susceptible. The blood is virulent as are all organs containing blood. Very small doses are sufficient to produce the disease. The incubation period is three days. The urine is infective. Filtered material retains its infectivity. The authors propose to call the disease pig typhus (typhus du porc).

D. M.

* * * * *

[THE CHEMOTHERAPY OF CL. WELCHII TYPE A AND CL. SEPTIQUE INFECTIONS IN MICE. Stephenson, Dora, and Ross, Helen. (1940.) *Brit. med. J.*, March 23rd. 471-476. (9 tables, 5 refs.).]

The investigations were undertaken in view of their topical interest following a War Office suggestion that all wounds likely to become secondarily infected with coccal or gas gangene organisms should receive prophylactic sulphanilamide treatment. Preliminary experiments showed that the sulphanilamide group were unable to prevent the death of mice injected intravenously with one minimum lethal dose of the toxin of either *Cl. welchii* type A, or *Cl. septique*.

In further experiments, two strains of *Cl. welchii* type A were used, one being a poor toxin producer, and the other being of known high toxigenicity. The drugs used were sulphanilamide and sulphapyridine, suspended in distilled water after grinding with gum acacia and administered by stomach tube to groups of mice which were observed for at least a week. Dosage was varied and effects noted regarding the time of administration in relation to the time of infection.

Sulphanilamide and sulphapyridine protected mice against a small number of m.l.d.s of either strains injected intraperitoneally as suspensions of vegetative organisms in sterile soil suspensions. Treatment with antitoxic serum was effective against the strain of high toxigenicity, but failed against the one of low toxigenicity which is probably more invasive. When infected soil suspensions were injected intramuscularly more organisms were necessary for a fatal result, and the drugs were only effective against a sublethal infection, serum treatment being much more effective.

Two strains of *Cl. septique*, both of high toxigenicity, were investigated on similar lines. Results showed that sulphanilamide had little influence on infections produced by intraperitoneal or intramuscular injections of sporing or non-sporing organisms in calcium chloride solution or sterile oil suspension. Sulphapyridine was more satisfactory; in large doses it saved 50 per cent. of all animals, but treatment with a single dose of serum was equally effective. The best results were obtained when sulphapyridine was combined with serum, large doses of the drug being given immediately after infection, and the serum up to 24 hours later.

With two strains of *Cl. oedematiens* tested, so far neither sulphanilamide nor sulphapyridine has had any influence on the course of the infection.

A. E. K.

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[THE TOXICITY OF SOME DIPPING FLUIDS CONTAINING ARSENIC AND SULPHUR. Steyn, D. G., and Bekker, P. M. (1938.) *Onderstepoort J.* **2**. 247-255. (4 tables.).]

The paper relates first to experiments carried out with arsenical dipping fluids. These are very exten-

sively used in the Union of South Africa in the eradication of ticks, lice, and scab mites. Accidental arsenical poisoning in stock is a frequent occurrence. The information supplied in the paper, therefore, is of considerable practical interest.

The following solutions of sodium arsenite are employed on a very large scale as dipping fluids for cattle and sheep :—

(*a*) Three-day dipping fluid containing 0·08 of As_2O_3 per 100 c.c. Of this fluid approximately 1,200 to 2,500 c.c. would be fatal to a full-grown beast and 300 to 600 c.c. for a sheep.

(*b*) Seven-day dipping fluid containing 0·16 gramme of As_2O_3 per 100 c.c. Of this fluid a fatal quantity for a full-grown beast would be approximately 600 to 1,250 c.c., and for a sheep 150 to 300 c.c.

(*c*) Fourteen-day dipping fluid containing 0·24 gramme of As_2O_3 per 100 c.c. Of this fluid approximately 400 to 800 c.c. would be fatal for a full-grown beast and 100 to 200 c.c. for a sheep.

From experiments carried out it is concluded that 0·15 gramme of the " Cooper's Double Dipping Powder " per kg. of body weight constitutes the m.l.d. for the rabbit ; and similar experiments with " Cooper's Powder " indicate that 0·06 gramme can be considered the approximate m.l.d. per kg. body weight of rabbit. From these results it appears that " Cooper's Powder " given *per os* is approximately two and a half times as toxic as " Cooper's Double Dipping Powder." This, however, does not apply to cases where animals are dipped in solutions prepared from these two powders. Sheep, cattle, and horses are more susceptible than rabbits to the effects of arsenic, and the m.l.d. of an arsenical preparation for any particular class of animal depends upon its degree of solubility in water ; whether water is drunk soon after having ingested it, or not ; whether taken on a full stomach or not ; and whether vomiting occurs after ingestion, or not.

With regard to several proprietary sulphur dips tested, it was found that the m.l.d. of diluted (dipping-strength concentration) " Capex Lime Sulphur Dip " for rabbits is approximately 7·5 c.c. per kg. of body weight and for sheep approximately 15 to 20 c.c. per kg. body weight. In dipping-strength concentration " Tarzan Lime Sulphur Dip " and " Nelson's Sodium Polysulphide Dip " possess approximately the same degree of toxicity as " Capex Lime Sulphur Dip."

L. E. W. B.

STAFFING OF ESSENTIAL MEDICAL POSTS

The Minister of Labour and National Service has decided that so far as may be necessary to ensure the provision of adequate medical staff for hospitals or for other public purposes he will exercise his powers under Regulation 58A of the Emergency Powers (Defence) General Regulations to direct doctors to perform such services as he may specify. For the present, directions for this purpose will normally be given only to medical practitioners (men or women) within the first two years after their first qualification. It is anticipated that essential posts will be staffed in the great majority of cases on a voluntary basis, and that it will only be in a minority of cases that compulsory powers have to be exercised.

ROYAL COLLEGE OF VETERINARY SURGEONS

Membership Examinations, 1940

LIST OF SUCCESSFUL CANDIDATES

(*Continued from page* 548.)

Veterinary College of Ireland

FIRST YEAR :

Barron, J. M.
Beirne, J. P.
Black, R. A. (B)
*Boyd, N. C.
Burgess, S. R.
Casey, P. M. (B)
*Clarke, A. R.
Cooney, John.
*Curtis, R. G.
*Dancey, G. F.
Earnshaw, R. E. (B)
*Fiddis, W. A.
*Finlay, J. T. T.
Fitzpatrick, D. (C)
Gavagan, P. B. (C)
†Gilmore, R. A.
Gleeson, E.
*Hall, R. C. R. K.
Harris, K. A.
*Hunt, T. G.
Kay, E. D.
Kelly, D. L. (C)
McCarroll, P. J. (B)
McGettigan, C. J.
*Marshall, J. V. O.
Moloney, E.
*Mullin, W. J.
Murphy, L.
O'Farrell, J. D.
Shearman, F. E.
Sweeney, P. A. (C)
Sweeney, P. J. A.
Wall, Brian.
Walsh, R. A.
Wolfe, F. E. (B)
Yourell, Miss J.

†Denotes first class honours.
*Denotes second class honours.
(C) Denotes credit in Chemistry.
(B) Denotes credit in Biology.

SECOND YEAR :

Aitken, J. (P)
Burke, E. S.
*Carmichael, R.
Connolly, G. F.
Corridon, M.
Dalzell, K.
Dwyer, A. J. (H)
Eivers, B. (H)
English, P. J. (H)
Fitzgibbon, J. P.
Foley, J. (H)
Freeman, W. J. (H)
Halpin, F. B. (H)
Hodgins, R. D. (H)
*Huey, J.
Jackson, T. W. (H)
Jolley, C. T.
Kelly, R.
†Kelly, W. R.
Lawther, J. R.
Lee, R. P. (H)
Leonard, T. B.
Lyness, T.
McAtee, P. J. (H)
McCarroll, J. J.
McCullough, M. R.
*McGarry, J. J.
O'Connor, J. G.
*Neill, W. D.
O'Regan, R. J.
Power, J. H. (H)
Rice, D. P.
Roe, M. C. (H)
*Steele, T. H. J.
Tyrrell, J. T.
Wildman, W. D.

†Denotes first class honours.
*Denotes second class honours.
(P) Denotes credit in Physiology.
(H) Denotes credit in Histology.

THIRD YEAR :

Allison, P. T. M. (H)
Beattie, F. W.
Blake, P. A.
Brown, C. C. B.
*Burgess, D.
Condron, G. C.
Duigan, T.
Farrell, H. F.
Gwynn, O. R.
Harrington, D. P.
Johnston, J.
*McErleen, B. A.
McGowan, T. E. (A)
Magee, B. L.
Mockler, T. V. (A)
Mullan, J. F.
Murphy, R. T. M.
Parkhill, J. S. (H)
Russell, Miss E. B.
Scally, W. C. P. (A)
Singh, B. S.
Sheehy, P. J.
Stewart, J. E. (P) (A)

*Denotes second class honours.
(P) Denotes credit in Pharmacology.
(A) Denotes credit in Anatomy.
(H) Denotes credit in Hygiene.

FOURTH YEAR:

Bowen, L. T.	Lynch, T. J.
Byrne, D. H.	McCall, W. J.
†Carlisle, James	McCrea, C. T.
*Davison, W. F.	McEvoy, B.
Dodd, A. M.	Meegan, P. A.
Donnelly, A. D.	Nayar, R. J.
*Gallagher, M. Anthony	O'Keefe, D.
Gallagher, M. Alphonsus	O'Kennedy, J. K. (Paras)
Griffiths, O. V.	Parkhill, Miss M. E.
*Htwe, M. S.	Power, W. P.
*Hutch, L.	*Quinn, B. J.
Kane, G. J.	Thompson, T. W.
Kavanagh, S.	†Whitby, B. T.
Kinsella, L. K.	Yasin, S. A.

†Denotes first class honours.
*Denotes second class honours.
(Paras) Denotes credit in Parasitology.

FINAL YEAR:

Bassett, B. D.	Mukerjee, K. C.
Bolton, S. R.	Murphy, P. J. L.
Burkhardt, J. A. (M)	O'Hagan, A.
Drake, V. A.	O'Hagan, P.
Hutch, Sean (S)	*O'Leary, C.
McCormack, H. J.	Qasuria, A. M.
McCrea, J. C. G.	Treanor, G. A. (M)

*Denotes second class honours.
(M) Denotes credit in Medicine.
(S) Denotes credit in Surgery.

Liverpool

FIRST YEAR:

*Carlill, S. D.	Edwards, H.

*Denotes second class honours.

IN PARLIAMENT

The following questions and answers have been recorded in the House of Commons recently:—

West Indies (Appointments to Posts)

Mr. Creech Jones asked the Under-Secretary of State for the Colonies what progress has been made in the adoption of the recommendations of the Royal Commission on the West Indies; who is the new controller; and what other appointments have been made?

The Under-Secretary of State for the Colonies (Mr. George Hall): As my Noble Friend announced in another place on July 2nd, he has selected for the post of Comptroller for Development and Welfare in the West Indies, Sir Frank Stockdale, Agricultural Adviser to the Secretary of State for the Colonies, whose distinguished service in the West Indies and other Colonies admirably fits him for this task. The selection of Mr. A. J. Wakefield, Director of Agriculture, Tanganyika Territory, to be Inspector-General of Agriculture for the West Indies, was announced on May 22nd. The selection of advisers on labour, public health, education and social welfare is proceeding, and I hope that announcements may be possible before very long regarding some or all of these posts. These appointments, together with the financial provision in the Colonial Development and Welfare Act, form the basis on which action can be taken on the recommendations of the West India Royal Commission. In the meantime, Governors have furnished most valuable material regarding the application of the recommendations to the particular problems of the territories for which they are responsible, and consideration of this is proceeding.

Substitute Feeding Stuffs

Captain Sir Ian Fraser asked the Minister of Agriculture whether research is being undertaken by his Department or by others, with a view to providing, from home-grown agricultural products, subsitute poultry food such as dried potato meal, ensilage and sugar-beet pulp?

Mr. Hudson: The results of research into the value in poultry feeding of substitute feeding stuffs, including those named by my hon. and gallant Friend, are recorded in "Growmore" Leaflet No. 14, one of the war-time publications of my Department, of which I am sending him a copy. I may add that poultry nutrition research conducted since the war has been directed mainly to this subject.

Sir I. Fraser: Is my right hon. Friend aware that on the Continent, particularly in Germany, very great success has been attained by this substitute feeding, and will he see whether similar research and results can be obtained here?

Mr. Hudson: My hon. and gallant Friend will find that referred to in the leaflet of which I am sending him a copy.

. . . . .

National Milk Scheme

Mr. Parker asked the Parliamentary Secretary to the Ministry of Food whether the cheap milk scheme can be extended to invalids and persons dependent upon unemployment assistance of various kinds?

Mr. Boothby: The National Milk Scheme, which includes within its scope all expectant and nursing mothers and children under five years of age, has only recently been brought into operation. I am unable at present to consider its extension to other categories of the population.

. . . . .

Pig Feeding (Kitchen Refuse)

Mr. Emery asked the Minister of Agriculture in what localities he has planned to increase the supply of pigs by encouraging the Tottenham system of using kitchen refuse for pig feeding; and will he consult the Ministry of Food, with a view to taking the initiative while there is yet time and to extending the successful Tottenham system into other urban areas?

Mr. Hudson: The question is under consideration with my right hon. Friend, the Minister of Supply.

REVIEW

["**SINGLE AND PAIR HORSE DRIVING.**" By Major-General Geoffrey H. A. White, C.B., C.M.B., D.S.O. Published by the National Horse Association.]

It is refreshing to realise that in these days of motors there are still amongst us some who are keen on experiencing the pleasures and joys of the pre-Great War period.

This book, which has been written by an expert, will give the uninitiated descriptions of the harness and directions on the harnessing of the horse, and helpful advice on the driving of single and pair horse turnouts. The illustrations of how to hold the reins are particularly good. Those who can mitigate their dependence on petrol by securing a horse and trap, can leisurely enjoy the beauties of the countryside.

This interesting book should prove most helpful to young people who have not had previous experience in driving horses.

Copies are being sold in aid of the recently formed Driving Club, and can be obtained from the National Horse Association, 12, Hanover Square, London, W.1, 1s. 0d. to members and 2s. 0d. to non-members.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Tuesday, Aug. 6th.—N.V.M.A. Committee Meetings at 36, Gordon Square, W.C.1: Survey 11.15 a.m.; Editorial 4 p.m.

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Compensation for Loss of Livestock

In the event of loss or damage to livestock as a result of enemy action, farmers can make claims to the Government for compensation. These will not be considered until after the war, when the rate of compensation will depend upon the funds then available. The basis upon which claims should be made is the value of the live animal.

Owing to this long delay before claims are considered it is in the interests of the farmer to obtain maximum salvage, as payment for salvaged carcases is made in the normal way; thus, the farmer receives some immediate payment towards the value of his livestock.

It is possible that salvage money may be deducted from the amount paid after the war by the Government, in response to the claim made.

As it is difficult to arrange for the valuation of an animal requiring emergency slaughter and to assess the value of a live animal from the carcase, it is advisable for farmers to make a valuation of their stock, from time to time, so that it may be possible to put a fairly reliable price upon any animal, whenever this becomes necessary.

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THE ROYAL VETERINARY COLLEGE

Purchase of Property at Streatley, Berks

In connection with the purchase, recently announced, by the Royal Veterinary College of Streatley House and the Beeches, Streatley, Berks, which since the outbreak of war have housed certain departments of the College, we are authorised by the Principal, Professor J. B. Buxton, to publish the following statement regarding the acquisition of the property:—

"The facts that led to the purchase were as follows:—

"The property was one of several being rented by the College in connection with its evacuation; part was held for the duration of the war and part on a yearly tenancy. It was recognised that, in the event of the buildings at Camden Town being damaged, it would be a long while after the war before the money for their reconstruction could be obtained and still longer before they could be made ready for actual occupation. The work of the College would have to be carried on somewhere. There was the further consideration that a substantial sum of money had been spent on converting Streatley House and The Beeches for use as a College and Research Institute respectively and the question of restoration would have arisen at a later date. On financial grounds as well as for security of tenure, the step had much to recommend it. While the need for a Field Station for the teaching of certain aspects of the work of the several departments of the College as an adequate supplement to the facilities at Camden Town has long been in the minds of the Governors, the acquisition of the Streatley property must not be regarded as fulfilling all those requirements, but only as an emergency provision. It is to be hoped that when circumstances permit, much more extensive facilities will become available for the establishment of a centre in the country as an adjunct to Camden Town for the training of our students in veterinary practice."

PERSONAL

Births.—Allan.—At Fernwood House, Newcastle-upon-Tyne, July 26th, 1940, to Norah, wife of H. Birkett Allan, a son.

Stewart.—At the Gables Maternity Home, Newcastle-upon-Tyne, on July 25th, 1940, to Ethel Marian, wife of W. Lyle Stewart, a son.

[In connection with the above announcements, we deem worthy not only of note but of special congratulation to those concerned, the coincidence that within twelve hours—so we are given to understand—sons should be born to both the President and Secretary of the North of England Division, N.V.M.A.—*Editor.*]

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Forthcoming Marriage.—The engagement is announced between Alan Donnelly, Solicitor, eldest son of Mr. Andrew A. Donnelly, M.R.C.V.S., and Mrs. Donnelly, Horpur House, Drogheda, and Eileen, only daughter of Professor J. J. O'Connor, M.R.C.V.S., and Mrs. O'Connor, 116, Morehampton Road, Dublin.

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R.C.V.S. OBITUARY

Parker, Thomas, F.R.C.V.S., Beechfield, St. George's Crescent, Monkseaton, Northumberland. Graduated London, December 18th, 1900. Died July 16th, 1940.

Mr. Thos. Parker, F.R.C.V.S.

In the death of Mr. Thomas Parker, F.R.C.V.S., which we record with much regret, and who passed away in a nursing home following an operation, the profession loses a much-esteemed member and the National Veterinary Medical Association a staunch supporter, who was a familiar figure in discussion at many Congresses.

Mr. Parker was Chief Veterinary Officer, Newcastle-upon-Tyne, for thirty years, retiring in October, 1937. The year after qualifying at the Royal Veterinary College, London, he left for service in the South African campaign, being attached to Colonel Reay's column as Veterinary Officer and as Remount Officer. For some time he officiated as operating surgeon at the Base Hospital and was later in charge of the Infectious Diseases Hospital, Bloemfontein. He received the South African (Queen's) war medal with five clasps and was made an Honorary Freeman of the City of Newcastle-upon-Tyne in recognition of his voluntary service in the campaign.

Securing his Fellowship in 1906, he took up practice in Morpeth, eventually succeeding Mr. Clement Stephenson as Veterinary Officer with Newcastle Corporation. Mr. Parker was a member of the Board of Examiners (Meat and Other Foods) of the Royal Sanitary Institute, and a member of the Departmental Committee on Meat Inspection which sat during the years 1920-21. He contributed many valuable articles to the veterinary periodicals, noteworthy amongst these being contributions concerning epizootic lymphangitis, tuberculin testing and meat inspection.

We extend our sincere sympathy to the widow and two daughters, one of whom holds the position of Child Welfare Medical Officer under the Newcastle-on-Tyne Corporation, while the other is the wife of an entomologist in the Sudan Government Service and resides in Khartoum.

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Robert Jonathan Hickes, J.P., F.R.C.V.S.

An Appreciation

There are few members of the profession to-day who cannot recall the circumstances attending their first meeting with the late Mr. Hickes.* For thirty years he was Examiner in Surgery to the Royal College of Veterinary Surgeons and few of the anxious students who appeared before him realised at the time that his brusque manner was only a cloak which concealed one who was

*The passing of Mr. Hickes we recorded with deep regret in our last issue.—*Editor.*

by nature shy and reserved and who tried to get the best out of every student who came before him.

What a rich personality was discovered by those of us who later were fortunate enough to pierce this screen. What a fund of information he had concerning the men who by their labours had brought the veterinary profession to its present high position; what tales of the stirring days as a student at the New College, Edinburgh, under Principal Williams, of the brilliance and originality of that great teacher; what anecdotes of the stalwarts who were in Edinburgh then and of his association with outstanding veterinarians like Stephenson, Hunting, Cope and many others whose names are now fading from the memories of the present generation.

To be in his company for an evening and listen to his reminiscences was an inspiration for a young graduate. Did the conversation turn to literature, one found that there were few standard authors with whose work he was not fully conversant; to history, particularly Scottish history, his knowledge of the Highlands and the Clans amazed one. Scott was, I think, his favourite author, and on retiral from active practice a few years ago, it was to this author he turned for solace in a distracted world. He was an ardent book lover and possessed an extensive library in which the Sciences were well represented. Everything appertaining to the soil claimed his interest. Descended as he was from yeoman stock of the North-Eastern Counties, he inherited a love of agriculture and husbandry which remained with him all his days. He took a great interest in the young farmers movement and started a Discussion Society in Market Weighton for their benefit. His papers to this Society on the evolution of village life in England are evidence of the deep interest he took in the lives and welfare of his fellow countrymen.

As befitted a true countryman, he had considerable knowledge of the stars and gardening occupied his leisure time. The radio he only used to obtain the exact time each day, and he would never allow a telephone in his home. The internal combustion engine was, I think, his chief aversion. When it became necessary for him to replace his horses it was a steam car that he chose. To those of us who knew him the choice was natural.

Early in the last war he lost his only son, a promising lad, who on leaving school joined the Air Force, and was killed in combat on the Western Front. From this blow neither Mr. Hickes, nor his wife who pre-deceased him by a few years, ever fully recovered. The boys at Bootham School, York, at which his son had been a scholar, took the place in his life of the son whom he had lost. On them he expended his thought and care. Nothing gave him more pleasure than the annual visit which the Scientific Society of the School paid to him at Market Weighton, when after exploring the natural history, archeological and geological features of the neighbourhood they were his guests at Givendale Lodge.

Of his life as a veterinarian much might be written. For many years he conducted an extensive practice in Yorkshire and in addition carried out the duties of County Veterinary Officer for the East Riding County Council. Later he disposed of his private practice and became whole-time official of that Local Authority. During his career he was frequently called on to give evidence before Royal Commissions and Committees investigating veterinary and allied problems and his evidence was characterised by a robust individual outlook and opinion, founded on personal observation and research.

He eschewed popularity and scorned any course of action which could not bear the most strict scrutiny. In his life he exhibited all the qualities of uprightness of character and stedfastness of purpose which are associated with the Quakers. Justice was a ruling passion with him, and the peasant farmer received the same treatment from him as the wealthy landowner. At a time when it was customary for practitioners to have their dispensing shelves laden with draughts and powders ready for all the sundry conditions that might befall the various domestic animals, it was refreshing to work for a spell at Market Weighton and find that results equal to the best shown in drug vending practices could be obtained in a large practice where drug vending was unknown. In his practice the "*vis medicatrix naturae*" got full scope. The influence of Williams' teaching remained with him throughout his life—the principles underlying the subject were what mattered.

It was this view he held both in the field of surgery and in the wider spheres of life: make sure your principles are right and then stick to them. Compromise was anathema to him if it involved any lowering of his standards.

J. G. M.

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LEGAL NOTES

Operation on a Cat: Unqualified Practitioner Fined.—At the South Western Police Court before Mr. Mullins, recently, Constance Nott, 32a, Haldon Road, Wandsworth, was summoned by the Royal Society for the Prevention of Cruelty to Animals for performing an operation on a cat without exercising due care and humanity. Defendant did not attend the court.

Mr. Jones, for the Society, said the case was a typical one of an unqualified practitioner operating and not doing it properly.

William J. T. Neale, 66, Ringford Road, Wandsworth, said that on May 18th he sent his two-year-old cat to Miss Nott's animal dispensary at 32a, Haldon Road, for an operation. On May 24th he called and Miss Nott told him it was doing well but was not functioning in one respect. On May 25th he fetched the cat away and took it to Mr. Wright, a veterinary surgeon.

Inspector Edwards, R.S.P.C.A., stated that on May 4th he cautioned defendant about operations on animals. She said, "Other people do it and I'll do it." On May 26th witness saw the cat, a white male Persian, at Mr. Wright's surgery. There was no doubt that its condition had caused it pain and suffering. Afterwards he saw defendant and told her he had been informed she had operated on the cat. Defendant said, "I operated on the cat on May 19th. I used chloroform. A septic condition arose after. The operation was forced on me against my better judgment." She also said that in view of what had happened she would not operate any more on cats.

Mr. Thomas Lewis Wright, veterinary surgeon, said the cat was fully grown. The operation was not properly performed and the place had become septic. The cat must have suffered.

"She's sent me a long testimonial from a Presbyterian minister," said Mr. Mullins. "I should like to have her here to talk to her. I shall fine her 40s. and two guineas costs."

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UNIVERSITY OF EDINBURGH DEGREE OF B.Sc.

At the Graduation Ceremonial of the University of Edinburgh, on Wednesday, July 17th, the following students of the Royal (Dick) Veterinary College were awarded the Degree of Bachelor of Science in the Department of Veterinary Science: Alton, Godfrey Greensit; Blanshard, William; Cameron, James Montgomery; Lambert, Alastair Legerwood; Milburn, Walter Buchanan; Rennie, James Douglas; Robarts, Douglas Leslie; Steele, Hugh Batchelor; Watson, James; Williamson, John Matthew; Wood, Dennis William, and Ziffo, George Stephen.

The Louis Cameron Undergraduate Prize in Bacteriology was awarded (joint conferment) to Khwajah Abdul Mannan, B.Sc. (Punjab), of the Dick College.

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BRUCELLOSIS MELITENSIS ORDER, 1940

Following are the provisions of the Brucellosis Melitensis Order of 1940, issued on July 3rd by the Minister of Agriculture and Fisheries:—

Compulsory Slaughter of Diseased Animals

1. The Minister may if he thinks fit cause to be slaughtered any animal which in his opinion is affected

with brucellosis melitensis or has in his opinion been in any way exposed to the infection of that disease.

Compensation

2. The Minister shall for animals slaughtered under the provisions of Article 1 of this Order pay compensation of a sum equal to the value of the animal immediately before it was slaughtered disregarding the fact that the animal is affected with brucellosis melitensis or has been exposed to the infection of that disease.

Value for Compensation

3. The valuation of an animal as required for the purpose of compensation shall, before slaughter, be ascertained by agreement in writing between the Minister and the owner of the animal, and shall, in case of dispute, be ascertained in the manner provided by the Animals (Miscellaneous Provisions) Order of 1927.*

Detention and Isolation of Animals and Precautions to be Adopted to Prevent the Spread of Infection

4. (1) A Veterinary Inspector, acting under the general or special direction of the Minister, may by notice served on the owner or person in charge of any animal, which in the opinion of the Minister is affected with brucellosis melitensis or which he suspects is so affected, or which has been in any way exposed to the infection of that disease, require the owner or person in charge to detain the animal on the premises specified in the notice and to keep the animal isolated, as far as practicable, from other animals, and with a view to prevent the spread of infection to adopt such other precautions as may be specified in the notice.

(2) A Veterinary Inspector acting under the direction of the Minister may, by subsequent notice in writing to the owner or person in charge of the animal, direct that:

(*a*) such additional precautions as may be specified in such subsequent notice shall be adopted; or

(*b*) any requirement specified in any notice served under this Article shall cease to apply or shall be modified to the extent or in the manner specified in such subsequent notice.

(3) For the purposes of this Article an animal which forms part of or is or has been in contact with any herd, flock or other group of animals in which the Minister has reason to believe that the disease exists or has existed may be suspected to be affected with brucellosis melitensis.

(4) A copy of any Notice served by a Veterinary Inspector under this Article shall, with all practicable speed, be sent by him to the Local Authority.

5. No animal shall be permitted to enter any premises in respect of which a Notice has been served under Article 4 of this Order and is still in force except with a licence granted by a Veterinary Inspector and in accordance with such conditions as may be specified therein.

[*Article 6 deals with Cleansing and Disinfection of Premises, Utensils, etc.*]

Extension of Meaning of "Disease" for the Purposes of the Diseases of Animals Act, 1894, *and Application of Section 22 of the Agriculture Act,* 1937

7. The definition of "disease" in the Act of 1894 is hereby extended so as to include brucellosis melitensis which shall also be a disease to which Section 22 of the Agriculture Act, 1937, applies.

Offences

8. Any person committing or aiding, abetting, counselling or procuring the commission of any breach of the provisions of this Order or of any notice served thereunder; or failing to comply with any such provisions or with any direction or requirement given or made under this Order, shall be deemed guilty of an offence against the Act of 1894.

* S.R. & O. 1927 (No. 290), p. 78.

Local Authority to Enforce Order

9. The provisions of this Order, except where it is otherwise provided, shall be executed and enforced by the Local Authority.

[*Article 10 Treats of Interpretation of Terms.*]

Extent

11. This Order extends to England and Wales and Scotland.

Commencement

12. This Order shall come into operation on the third day of July, nineteen hundred and forty.

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H.M. STATIONERY OFFICE PUBLICATION

The undermentioned has been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at the following addresses—London: Adastral House, Kingsway, W.C.2, and 28, Abingdon Street, S.W.1; Cardiff: 1, St. Andrew's Crescent; Manchester: York Street; Edinburgh: 120, George Street.

	Price net s. d.	*Post free* s. d.
Statutory Rules and Orders, 1940 (No. 1251): *Diseases of Animals.* Brucellosis Melitensis Order, July 3rd, 1940 ...	0 1	0 2

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FOOD POISONING

In a leading article following upon a discussion at a meeting of the Royal Sanitary Institute on food poisoning and on the supervision of the food supplies—both matters of high importance in times of war—the *British Medical Journal* observes: "Two decades ago the term 'food-poisoning' only suggested intestinal invasion by one of the Gaertner group of bacilli. This group, now known as the genus Salmonella, has been further explored until nearly a hundred types have been described. Sir William Savage,[1] when emphasising the true parasitism of these bacilli, in spite of their presence in the intestines of carriers in the animal kingdom—particularly rats and mice—referred to the manifestations of human infection other than gastro-intestinal irritation—namely, continued fever, septicaemia, arthritis, and meningitis. The risk of food-poisoning is of especial importance in troubled periods when the ordinary routine of preparation and distribution of food may be dislocated. Perry reported a number of outbreaks of Salmonella 'food-poisoning' among soldiers in the war of 1914-18, and those in control of the preparation and storage of Army food are alive to these dangers. Almost any form of food may be the vehicle if it has been exposed to specific contamination by the excreta of rodents or by human beings temporarily discharging the specific bacteria as a result of an unrecognised Salmonella infection. Food stored already cooked is the most likely to be a danger in this way, but specifically contaminated raw food materials such as meat from a Salmonella-infected animal, eggs (especially those of ducks), milk, etc., may retain living and pathogenic members of the food-poisoning group after ordinary forms of cooking. Different methods of detecting and isolating these bacilli have been often tested. One worker will plate the fresh faeces or suspected food on MacConkey medium, pick off a suspicious colony next day, and by slide agglutination will within 18 hours of receipt of the specimen, give the clinician a provisional diagnosis, almost invariably confirmed by further plating, fermentation, and other tests. By preliminary enrichment, plating, fermentation tests, and final agglutination, another clinical pathologist may give his diagnosis only after several days. A. C. Ruys[2] in several years' work

(1) *British Medical Journal.* (1940.) 1. 408.
(2) Ibid. (1940.) 1. 606.

compared different methods—Endo plate, brilliant-green Esbach plate, preliminary enrichment in Müller tetrathionate broth, or this medium with brilliant-green—and found that brilliant-green-picric-citric-acid plates gave the best chance of detection of the Salmonellas. It is probable that no single method at present known will invariably beat all the others, so that a combination of methods is still advisable in routine work.

"It is convenient to regard attacks of food-poisoning either as an infection with bacilli which in the course of 12 to 18 hours produce in the intestine sufficient toxin to cause the characteristic symptoms, or as an intoxication with food containing toxin formed at room temperature before ingestion and productive of symptoms in perhaps one to three hours. Botulism and staphylococcal poisoning clearly belong to the latter group; the position of the Salmonellas is not quite clear. It is certain that the toxic material made by Savage and the polysaccharide complexes isolated by Boivin, Raistrick and Topley are relatively heat-stable and may be irritant to laboratory animals, but whether the Salmonellas can produce in stored food substances which cause almost immediate food-poisoning in man does not seem to be clear, and is certainly exceptional. The view mostly accepted is that the Salmonellas produce their toxin in the intestinal canal. Whether the toxin is produced before ingestion or after, it is clearly the duty of those providing food to protect it from the risk of contact with faeces or urine of rats and mice, and to prevent the use of contaminated milk or other raw food. Food-poisoning by infection with dysentery bacilli was recorded by Savage[3] four times in a hundred outbreaks. Outbreaks of Flexner dysentery may be both clinically and epidemiologically indistinguishable from Salmonella infections. Food-poisoning from *Cl. botulinum* is fortunately exceedingly rare in England, and fewer than half a dozen outbreaks are on record, but both Types A and B of the bacillus have been identified in Britain, and attacks of sudden illness with the well-known blurred vision, diplopia, dizziness, and dysphagia will at once suggest botulism to the clinician. Vomiting and diarrhoea are characteristically absent, making easy the distinction from Salmonella infections.

"Since the discovery by J. T. Parker[4] in 1924 that the staphylococcus produces a toxin, the tragic deaths of twelve children in Bundaberg in 1928 after the injection of diphtheria prophylactic containing staphylococcus toxin, and the proof by Jordan, Dack, and co-workers[5] in 1930 that certain staphylococci secrete an enterotoxin powerfully emetic and purgative to man, these cocci have perforce engaged the attention of the bacteriologist. Informative recent reviews by F. C. Minett[6] and J. E. Blair[7] are available. But much still remains for further investigation. The enterotoxin, preformed in the food eaten, gives rise to a typical syndrome. Intestinal pain with vomiting and profuse diarrhoea may occur within 30 minutes to four hours of the consumption of the infected food; deaths are rare and recovery is usually rapid, the patient returning to his work after troublesome dislocation of his life for some hours or one or two days. At a dinner in Canada, described by Roberts,[8] 96 persons became ill after eating a coconut-cream pie. Slocum and Linden[9] recorded 20 outbreaks, with 1,078 victims, apparently caused by infected ham and beef-tongue. The foods they found to become infected were milk, cream, custard, gravy, cheese, hams, and salt-cured beef-tongue. Unfortunately the salt concentration used for curing, though sufficient to prevent the growth of many bacilli, may not discourage cocci. The identification of the causal staphylococci is not easy. Dolman is quoted as thinking that few strains produce enterotoxin, but Roberts and Wilson compiled a table indicating that of 105 strains, apparently almost all *aureus* when isolated, 47 per cent. made enterotoxin. The final criterion is the power of a filtrate to cause the symptoms in human volunteers. Even this test is not simple, for in the opinion of some workers individuals vary in their susceptibility to toxin; yet only six of the 102 people reported by Roberts escaped with no symptoms. The human test or a similar test on monkeys is obviously impracticable for general and rapid investigation; Dolman fortunately discovered that enterotoxin when injected into the peritoneum of kittens weighing between 400 and 1,000 grammes caused early vomiting and diarrhoea. Most investigators make the reasonable assumption that this kitten test reveals the same poisonous substance which affects man, and the test is, for the moment, accepted. Other methods of differentiating staphylococci are available.

"The protection of the community against enterotoxin is not simple. Minett[6] in London produced enterotoxin from staphylococci present in a cow's diseased udder. This danger from milk calls for more careful supervision of cows and also justifies a demand for the New York practice of compulsory pasteurisation of all milk. Apparently pure food can be contaminated by food handlers who carry peccant cocci in nose or throat, and Roberts and Wilson relate that the unfortunate owner of a bakery with plant and equipment in excellent sanitary condition remained for at least a year a carrier of the 'same strain of staphylococcus' which poisoned many people. Unfortunately the enterotoxin, which may be produced in large quantity in infected food in a few hours at a temperature of 22° C. without evident alteration of appearance or taste, is strongly heat-resistant and may withstand boiling for 30 minutes. Heat sterilisation must therefore be applied early, either to the raw food or to the food mixture immediately it is made and before the toxin can be formed. The baker and the housewife will be pleased to learn that Dack and his colleagues pasteurised puffs and éclairs without detriment to flavour or appearance. If, despite all precautions, the food becomes contaminated liberally with staphylococci, toxin will not be produced if the food is cooled rapidly and stored in the refrigerator.

"It is curious that, while staphylococcal food-poisoning is regarded by Slocum and Linden[9] as the commonest form in the U.S.A., the number of outbreaks reported in detail in the medical journals in England is negligible. The implication is that this source of infection may not here be receiving sufficient attention, though the Ministry of Health in annual reports and otherwise directs attention to it. W. M. Scott in a valuable review presented to the sixth Pacific Scientific Congress at San Francisco records between 1929 and 1937 in England 548 outbreaks reported to the Ministry. Of these, 247 were traced to Salmonellas, 59 were recognised as bacillary dysentery, and 142 were 'toxin outbreaks.' The corresponding figures for 1938 were 138, 72, 8, and 21, the apparent increase being probably due to the greater interest taken in food-poisoning. The articles of food incriminated most often were canned or potted salmon, pressed beef, meat paste, tongue or beef, and meat pies. In 62 of the 'toxin outbreaks' the food still available yielded cocci in large numbers. In 45 instances *Staphylococcus aureus* or *citreus* was present, in four streptococci of the enterococcus group, and in some *Staphylococcus albus* alone was found; in five outbreaks only members of the subtilis-mycoides group were present in large numbers, and in default of further evidence had to be regarded provisionally as causal. Only one outbreak was traced to artificial cream, so common a cause in the U.S.A. Perhaps our cooler summer must be given the credit. Some of our manufacturers, schooled by troublesome recurrences and the impossibility of eliminating the numerous carriers from the staff, have installed an almost aseptic technique in the packing rooms, the air being filtered free from germs and the operators wearing masks and gloves."

(3) M.R.C. Special Report 92. (1925, London.)
(4) *J. exper. Med.* (1924.) **40**. 761.
(5) *J. Amer. med. Ass.* (1930.) **94**. 1648.
(6) *J. Hyg.*, Camb. (1938.) **38**. 623.
(7) *Bact. Rev.* (1939.) **3**. 97.
(8) *Canad. publ. Hlth. J.* (1939.) **30**. 590.
(9) *Amer. J. publ. Hlth.* (1939.) **29**. 1326.

TREATMENT OF STAPHYLOCOCCAL INFECTIONS WITH SULPHATHIAZOLE

At a recent meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine there was a discussion on clinical experiences with sulphathiazole, 2-(*p*-aminobenzene sulphonamido) thiazole, also known as M and B 760, in the treatment of staphylococcal infections. Dr. A. J. Ewins, chemical director of May and Baker, Ltd., reviewed the development of this drug, which was first prepared in Britain early in 1938. Sulphathiazole had recently been the subject of a number of U.S.A. publications in which it was claimed to be a particularly effective chemo-therapeutic agent against streptococcal infections, to be as effective as sulphapyridine against pneumococcal infections, and to be better tolerated and of lower toxicity than the latter drug. Sulphamethylthiazole was also mentioned, but Dr. Ewins understood this had been withdrawn on account of undue toxicity. Recently the Americans had suggested that sulphathiazole was far superior to sulphapyridine against staphylococcal infections.

In the discussion Dr. E. C. B. Butler described five cases of severe staphylococcal infection in which sulphathiazole had been used. In only one was there a really successful result. His conclusion was that sulphathiazole was of little proved value in patients with a strong bloodstream infection. Dr. H. M. McCrea reported on two cases of septicaemia due to infection by *S. aureus*, both having their origin in a carbuncle. After administration of the new compound the patients recovered completely. Dr. G. Melton mentioned six cases of osteomyelitis and five cases of carbuncle which had been treated with sulphathiazole. In three of the osteomyelitis cases the condition cleared up, and all the cases of carbuncle recovered.

Dr. H. S. Banks said that he had treated 15 cases of meningococcal infection with the new drug, and he had been impressed with the rapidity of clinical improvement. There appeared to be no nausea or vomiting. Dr. E. N. Allott remarked that urine specimens from patients who had been receiving sulphathiazole contained crystalline derivatives of the drug in large quantity. In a febrile patient who was possibly not excreting a large volume of urine the risk of interference by these crystals with the efficient working of the kidney was such that fluids should be "pushed hard."—*Pharm. J.*

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MINISTRY OF AGRICULTURE NEWS SERVICE

Potatoes for Layers.—Despite the experiences of many egg and table poultry producers in feeding potatoes there is still prejudice against their use. Doubts will be set at rest by a recent experiment at the National Institute of Poultry Husbandry, which showed that as much as one half (by weight) of the total food intake of laying birds could consist of cooked potatoes. This quantity had no ill effects on either body weight or production.

Bracken as Litter.—Oat and barley straw are too valuable for feeding purposes to use as litter in these times. At the same time it is necesary to conserve manure. Prospects for future supplies of potash are uncertain, and it is more important than ever to save liquid manure that is rich in this element. In districts where straw is scarce, or where it can be profitably fed to stock, farmers and horse-keepers should use for litter any other suitable material that may be available at a reasonable cost. Bracken (or fern) makes good litter, and in many places may be obtained for the cost of cutting and carting. It will absorb ammonia and urine when it is very thoroughly trampled. Dung made from bracken should be equal in chemical composition to dung made from straw, but it takes longer to decompose in the soil, the fibrous woody stem being only slowly attacked. It, therefore, opens up the soil more, and is most useful on a heavy clay. The cutting and drying of bracken at midsummer will not only provide valuable litter but will also check its growth, thus improving the land for grazing purposes. Where summer cutting is impracticable it may be cut and carted during suitable weather in autumn or throughout the winter.

Silage for Cows.—Mr. Philips Price, M.P. for the Forest of Dean, has recently made interesting observations on the silage he feeds to his cows. "I fed my dairy cattle," he said, "all through the last bitter winter on home-grown beans, silage and hay. The silage was made in four stacks, two from oats and vetches, one from clover and one from meadow grass. Molasses were added in each case." Only his heavy milkers were given imported cake. The result was that his milk yield remained normal throughout the winter. It dropped when the weather was exceptionally cold, but recovered with warmer spells. "I am satisfied," says Mr. Price, "that we have here one of the means of solving our feeding stuffs problem. Countries poorer than we, such as Finland and Sweden, have reduced ensilage to a fine art. But we who have lived on the fat of the world think that ruin stares us in the face because we cannot have large quantities of cheap imported feeding stuffs. But now, at last, we must farm, which I would define as 'the growing of crops and becoming as self-supporting as possible'."

No More Pheasant Rearing.—It is now illegal to hatch or rear pheasants artificially on agricultural land, including parks, except under licence from the Minister of Agriculture. This is in accordance with the Rearing of Pheasants (Prohibition) Order, 1940.

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STERILISATION WITH FORMALDEHYDE

"The older a disinfectant the more likely is it that belief with regard to its powers is based on imperfect observations," stated the *British Medical Journal* recently. "The use of formaldehyde dates from over 50 years ago, and most of the studies of its action were made when the methods employed were open to more or less serious criticism by modern standards. Dr. Gunnar Nordgren* has performed a valuable service by re-approaching this subject from the beginning and furnishing basic data obtained by exact quantitative methods, taking into account the various physical conditions upon which the bactericidal action of formaldehyde depends. It is clearly established by his results that under favourable conditions formaldehyde is a highly efficient disinfectant, capable even of killing spores in short periods of time. Much less reassuring are the results of experiments to determine its capacity for sterilising catheters. The obstacles to success in this process are several. Adequate penetration of the lumen does not take place unless either a preliminary vacuum or a rise in pressure during the process ensures it; penetration may in any case be prevented by the presence or condensation of water. This difficulty overcome, formaldehyde will sterilise a long narrow tube made of glass, but under the same conditions it will fail to sterilise a catheter made of rubber or silk web, evidently because a porous or irregular surface affords protection to bacteria. Nordgren emphatically condemns each of three types of apparatus now in use for this purpose, including that in which the vapour is supposed to pass through the catheter, which is attached to a tube through which it is supplied. In his view the sterilisation even of ureteric catheters by formaldehyde is feasible, but an apparatus which can be depended on for this purpose has yet to be designed. Catheters should hang in it in order that none of their outer surface may be protected by contact with a shelf or with other instruments; penetration should be assured by preliminary evacuation, which could with advantage be repeated several times, and the disinfectant gas admitted should be obtained by passing air through a saturated solution of formalin, not by vapourising para-formaldehyde, which is too slow a process. This monograph is not concerned with entirely different alternative methods of dealing with catheters, but it may well be asked whether some method of disinfection by a liquid is not feasible and preferable. Whatever the

**Acta path. microbiol. scand.* (1939.) Supp. 40.

method employed, it is likely to fail unless the catheter is perfectly clean and unless contact with the disinfectant is ensured throughout the lumen. If a liquid were used this would mean that the interior of the catheter should by some means be filled with it. Catheters are, of course, by no means the only items of surgical equipment which present difficult problems in sterilisation. Various methods of endoscopy involve the use of apparatus which is exceedingly difficult to sterilise without damage to some of its component parts, and future inventors of such instruments might well bear this consideration in mind in designing them. Other apparatus with electrical connections and some used in anaethesia also present difficulties. If Nordgren's results may be taken as typical of what the present methods are achieving, a general reconsideration of this subject in the light of modern knowledge and with a view to modern exigencies seems to be overdue."

* * * * *

VITAMIN P

"Much of the early work on vitamin P was carried out on human subjects suffering from vascular purpura, thrombocytopenic purpura, various infectious diseases, myxoedema, or diabetes mellitus. Experiments with guinea-pigs proved unsatisfactory. The criterion used for investigating the influence of fruit juices or preparations made from them on the course of the vascular and the thrombocytopenic purpura was the fragility of the capillaries. Scarborough* concludes that cases of purpura are not suitable for testing the possibility of the existence of a special vitamin for controlling fragility. He considers that the only cases suitable for such investigations are those of known low-vitamin intake, and he has encountered many of these with abnormally increased capillary fragility. This was measured daily, either by the 'positive pressure method,' where the fragility is determined in terms of the number of burst capillaries occurring during standard conditions in response to an increased intracapillary pressure; or by the 'negative pressure method,' in which the fragility is evaluated as the amount (in mm. Hg) of suction which is required to burst a single capillary loop, the suction being applied over a small area of skin. In some of his cases large doses of the known vitamins A, B_1, ascorbic acid, and D, in the most nearly pure forms available, were first given over long periods of time, but no decrease in fragility was produced. When, however, lemon juice or one of the so-called 'hesperidin' preparations was given there was at once a dramatic decrease in capillary fragility. The active substance is probably flavanone in nature. It can be given by mouth, by intramuscular injection, or by rectum. Thus, although he cannot consider previous experiments to have established the existence of vitamin P, Scarborough believes that he has himself obtained from experiments on human subjects evidence of the existence of a factor which decreases the fragility of capillaries."—*British Medical Journal* (March 30th, 1940).

*Biochem. J., 1939, 33, 1400.

* * * * *

War-time feeding was pleaded by a farmer at Merthyr Police Court when he appeared on a charge of selling milk deficient in butter-fat to the extent of 8 per cent. The Stipendiary Magistrate said that there were several elements to be taken into account, which could all be responsible for the deficiency of butter-fat. In view of the fact that there had been no allegation of water being added, and as usual amounts of feeding stuff were not available, the case would be dismissed.

* * * * *

The experimental insurance scheme for livestock conveyed by passenger trains is being renewed for a further period of 12 months, on the same terms and conditions. Under this scheme the owners of livestock may insure their animals against death or injury during transport, by the prepayment of premiums costing a few pence only. The scheme does not cover war risks.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

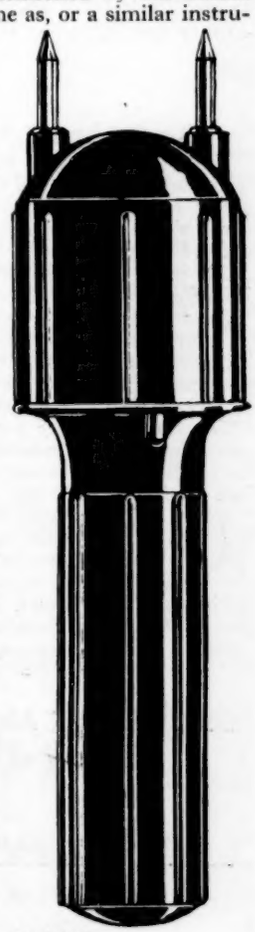
The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

* * * * *

THE "ELECTRICAL COAXER"

To the Editor of the Veterinary Record

Sir,—The electrical vibrator mentioned by the author of *Dutch Vet.* is doubtless the same as, or a similar instrument to, that known as the "electrical coaxer," which was introduced to me by Mr. L. Auchterlonie, M.R.C.V.S., of Nottingham, some five or six years since and which I have been happy to pass on to several brother practitioners. One finds many occasions to bless this instrument, but its main use is to "persuade" bovines to gain their feet, *e.g.*, parturition cases, after milk fever and at those times when one wants to know whether or not a cow could get up if she really tried! Also it is useful to persuade a cow *not to lie down!* One would wish to see its use universal as it does not leave painful after-effects as other means of persuasion may do.



It has once again been a "godsend" in a calving case from which I have just returned. The patient, a first calf heifer, was lying flat on her side and the farmer assured me that she could not get up. One touch of the "coaxer" was sufficient to make the young lady change her mind.

There may be some difficulty in buying one at the moment—the last I bought, some six months since, was the only one the suppliers had left—and it was "Made in Germany." Possibly someone may know whether there are any to be had of American make?

Yours faithfully,
Edward Wilkinson.

Holly Bush House,
139, Osmaston Road,
Derby.
July 16th, 1940.

[The illustration is reproduced from a descriptive leaflet forwarded by our correspondent.—*Editor.*]

* * * * *

"RESERVATION" OF THE PROFESSION

To the Editor of the Veterinary Record

Sir,—Living in Bath has been described as like "sitting in the lap of an old lady" in serenity, peace and semi-somnolence. I think Mr. Llewellyn Bevan is nearer the mark in his estimation of the present state of veterinary practice in this country than is Mr. Esmond Brown.

I consider, without too much persiflage:—

1. That agriculture has never been estimated at its true value in this country in regard to either livestock or arable cultivation.

2. That the raw material on which we ply our craft is not as plentiful as in past profitable years.

3. That except in the case of munitions and war work, the owners of many large buildings erected with the idea

that they would be necessary for increased trade and employment are now hard put to it by overhead charges. This factor has not increased town and city work, rather the contrary.

4. Many coastal veterinary surgeons have lost much, if not all, of their practices, and the fate of one or two of them is unknown.

5. The department of animal health has not yet been distinguished by any extraordinary push or "pep." No doubt we are as lively as "most growths" and "many good lads" are in existence, but how they will manage to get a living is a puzzle that even the Ministry of Agriculture with its fullest effort will hardly be able to solve.

Yours sincerely,

G. Mayall.

. . . . .

To the Editor of the Veterinary Record

Sir,—I have read without contrition the extremely witty letter of my old friend Mr. Esmond Brown who, as he reminds me, used to "set the pace" when forty years ago we were students together at the Royal Veterinary College, Camden Town.

In those days, he may remember, the College was literally crumbling in ruins—and it remained so until quite recently when, as the result of the appeals for help by the late Sir Frederick Hobday, the present palatial but deserted buildings were erected: a somewhat tardy recognition of the virtues of the veterinary profession.

Mr. Brown, or "Sunny Jim" as we affectionately called him, was ever a cheery soul, and it is pleasing to note that he has retained his optimism, even though it be of the ostrich variety. But I am afraid that when he has again given "his eyes a rub" and removed the "gravel" from them, he will find that things are not quite so rosy as they may appear through official spectacles. Indeed, there is many a farmer whose livelihood has "gone up in smoke" who would not share his optimism. Mr. Brown during his extensive and extended tours of Great Britain has no doubt observed the innumerable "bed and breakfast" notices attached to the farmyard gates and realised what they signify. These and the neglected lands, the weedy and depleted herds, the demand for overseas products, are an outward and visible sign of the decadence of agriculture to which I referred.

If Mr. Brown would honour me by reading, and not misreading, my letter, he would find that I said nothing derogatory concerning the veterinary profession. Rather the reverse. I said how efficient it was and ready to perform the work for which it was specially qualified, if the State would but assist it to do so. I certainly did not say that the general practitioner was a "draggled, moulting Dodo," or even imply it. I merely repeated what many a country practitioner has told me, that he would be "hard put to it" were it not for the income he derives from cat and dog practice. And according to recent letters in your columns, even this has has been seriously reduced.

Nor did I say or suggest that the profession was decadent, but rather that the pastoral industry in this country was becoming so and required the assistance of the veterinary profession to resuscitate it and place it upon a sound foundation for the future. I submit that recent events have proved my contention to be right and official "ballyhoo"—whatever that may mean—wrong.

I fully recognise that "we have a lively and healthy growth" and that "good lads are coming along" to develop our heritage. But how are they to do it unless employment is found for them in a reorganised and enlarged Service of Animal Health, or they sail the waters of the "Thames, Forth, Clyde and Mersey" to countries overseas where their services will be more generously appreciated?

I am, etc.,

Ll. E. W. Bevan.

Stringston,
Holford,
Nr. Bridgwater,
Somerset.
July 28th, 1940.

DISEASES OF ANIMALS ACTS, 1894 to 1937, and AGRICULTURE ACT of 1937 (PART IV)

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 16th to 30th June, 1940	11	18	—	—	—	—	—	216	148
Corresponding period in ...									
1939	29	35	6	396	1	4	5	155	106
1938	21	31	2	39	—	1	1	39	34
1937	27	29	1	131	3	3	5	51	39
Total 1st January to 30th June 1940	281	316	19	2,850	14	28	115	2,112	1,266
Corresponding period in									
1939	452	491	44	5,652	31	70	152	1,051	694
1938	481	533	155	19,940	42	70	103	300	216
1937	411	472	6	671	85	122	127	620	396

Note.—The figures for the current year are approximate only. § Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.* herds officially certified as free from tuberculosis, as at 30th June, 1940, was as follows:— England 3,790 ... Wales 9,317 ... Scotland 3,084 ... Total (Great Britain) 16,191

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